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GALVANISM,

Proved to be a

REGULAR ASSISTANT BRANCH OF MEDICINE;

ALSO,

"Interesting Inquiries concerning this Influence, with regard to Living Action:"

PARTLY TAKEN FROM

A FAMILIAR ANALYSIS

OF THE FLUID

CAPABLE OF PRODUCING THE PHENOMENA OF

ELECTRICITY, GALVANISM, AND COMBUSTION.

RESPECTFULLY DEDICATED

TO THE HUMANE SOCIETY.

BY MATTHEW YATMAN, ESQ.

Sua si bona norint!

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GALVANISM.

THE animal vital principle, formerly called " The nervous fluid" is the connecting medium between mind and body; the source and regulating spring of animal sensation and expression, action and motion, both voluntary and involuntary ; comprehending the circulation of the blood, respiration, and all the other vital functions, or *living actions.*

This is allowed to be " The electrical influence" formed in the lungs, by the action of the air, (in breathing) producing oxidation and "the chemical changes" upon the blood ; and which is separated from the blood by the brain and nerves; and conducted by them all over the vascular and muscular system, producing living action therein.

Galvani first proved the electrical quality of this principle of action, or "nervous fluid," by applying a single metallic conductor to a nerve and a muscle in the leg of a live frog; which, as soon as the circle was complete, produced a shock and contraction of the muscle: as the same conductor would act, when applied to the charged electrical jar.

This agrees with Mr. Davy's definition of galvanism.

"Electricity is capable of being excited by "the action of different conducting substances "on each other; but the modes of this excitation, and its *general* connexion, with chemical changes, constitute a science which has "hitherto been distinguished by the name of "Galvanism."

These electrical conductors he divides into two classes: I. Perfect conductors—charcoal, and the metals. II. Imperfect conductors—oxidated fluids; containing atmospheric air, oxygen, or acids; and substances containing oxidated fluids; living animals, or parts of living animals.

Of Simple Galvanic Circles.

" For the composition of a simple galvanic " circle, at least *two conductors* of *one class,* and " *one* of the *other class* are required: and they " must be *in contact with each other,* in *one,* or " more *points*; at the same time that they are " connected, *in other distinct points,* with the " conductor of the other class."—Davy.

" The galvanic influence is manifested in single " circles, either by *its power of acting upon* " *living animal organs,* or *by its chemical* agen- " cies."—Davy.

Galvani's experiment proves the first of these positions, by the negative action of a single metallic (perfect) conductor, forming a circle with two imperfect conductors, the nerve and the muscle of the live frog, which operated by merely conducting the electrical influence from the nerve to the muscle, without any chemical changes: this, therefore, is called the negative simple circle.—*See the Analysis.*

Dr. Garnet gives an instance of the chemical agency of the galvanic influence produced by a simple circle composed of two perfect conductors (a more and a less oxidable metal) *in contact with each other*, and connected with an imperfect conductor, producing the electrical fluid in consequence of the chemical changes, which always attend the formation thereof.—*See the Analysis.*

This, therefore, may be called the positive galvanic circle.

" If a piece of zinc be put alone into water, no
" change will take place; but if a piece of silver
" be put *along with it*, the zinc will *immedi-*
" *ately oxidate, and a current of electricity* will
" pass through the silver."—Garnet.

This current of electricity, produced by this positive simple galvanic circle, applied to a living animal body, excites action in both the vascular and muscular systems.

Mr. Davy says, " when the tongue is made
" part of a simple galvanic circle, an acid taste
" is produced; and when the eye is connected
" with it, a flash of light is perceived."—*See the Analysis.*

OF THE APPEARANCES OF GALVANISM IN LIVING ANIMAL ORGANS.

"The well known facts relating to the torpedo, "electrical eel, &c. prove that galvanism is "capable of being excited by living animal or"gans. These facts, compared with the pro"duction of muscular contractions by galvanism, "lead to *interesting inquiries* concerning the "relation of this influence to living action."—Davy's Lectures.

And shall we not pursue this glorious hint?

This living action may be divided into the regular and healthy; and the irregular, or disordered state.

When this electrical influence, this "nervous fluid," acts in regular proportion and equal energy all over the vascular and muscular systems, it produces health and bodily comfort.

A partial increase, obstruction, or deficiency thereof, occasions, what is very properly called *disorder,* with complaints of various kinds.

On this account the *pulse* is felt, as the grand index to the physician, whether stimulants or sedatives (which may be called positive, or negative medicines) are most likely to restore the equilibrium of action, by their influence on the nerves of the stomach, &c.

The extreme of muscular action is called spasm; and the extreme deficiency thereof paralysis, (by the old writers) *resolutio nervorum,* relaxation of the nerves, palsy; which is a branch of suspended animation, or " living action" in the part; and nearly allied to that general suspension, arising from drowning, &c. where restoration to life, and society, by friction and other exciting operations so frequently effected by the humane, so strongly urge, "Go thou, and do likewise." As " Every greater still contains a less," the above theories will apply to the cause and the removal of all degrees of muscular and vascular constriction or relaxation; increase or diminution of circulation; repletion or emptiness of vessels; producing obstruction, inflammation, pain, mortification of parts, oedematous swellings of the legs, with ulcers, called bad legs.

Dr. Garnet's theory and cure of the gout is wonderfully consonant with the above.

" We shall here state that the gout is a disease " of indirect debility, brought on by a continued " use of high seasoned food, and fermented " liquors."—*See his Zoonomia or Laws of Animal Life.*

" The gout seldom attacks persons employed " in constant bodily labour, and is totally un" known to those who use no wine or other fer" mented liquors."

" The inflammation of the extremities, may at " any time be relieved *by means of electricity;* or " by stimulant embrocations applied to the part: " and this *without any danger of throwing the* " *complaint on some more vital part,* as has been " generally imagined. If I were to apply debi" litating means, I should probably relieve the " pain, but, by debilitating the whole system, " should cause an attack of the stomach, or " some other internal part; but *by a stimulant* " *application,* I run no such risk."

" The inflammation is of the asthenic" (relaxed) " kind, dependant upon a debility of the " small vessels; whereby they do not afford " sufficient resistance to the propelling force; a " stimulating application to the part, *excites the*

" *debilitated vessels to action ;* their contraction " diminishes the morbid quantity of blood, and, " the balance between the propelling and the re- " sisting forces being restored, the inflammation " of course ceases."

" I have seen very violent gouty inflammations " very speedily relieved by electricity."—Garnet.

The Author lately met with a remarkable instance of the truth of these remarks.

A respectable agent of the Chelsea Water Works, in the agonies of a gouty spasm, in one of his great toes, sometime in February last, requested the loan of a pair of galvanic pointed conductors from the Author : one of copper and another of zinc, bound together, were sent, which were drawn from the base, to the point of his toe, for about half an hour ; by which time the spasm, the pain, swelling, and redness of the part were entirely removed, by the influence of this positive galvanic circle ; and he has had no return of pain, or any other disagreeable symptom whatever, since, which is above six weeks. There could be no fear of translation *upwards,* as these points were drawn along the toe, *from* the foot.

A young woman, in the autumn of 1809, being kitchen maid at an eating house, had an inflammation in both her eyes, which almost deprived her of sight. A medical person in the neighbourhood dropped a liquor into her eyes, which gave her pain sufficient to make her start from her seat, when it was applied; and he was of opinion that she never would recover her sight.

In the month of November, her eyes appeared to the Author, wholly inflamed, with a white speck, or cataract, in the centre of each eye, which rendered her almost entirely blind; she could just perceive the light and no more. Her own idea, that " skins had grown over her eyes," clearly explains her obscurity of vision. The Author lent her a pair of zinc and copper galvanic points, bound together; directing her to draw the points, lightly in contact, across the edges of the lids of both her eyes, down the side of her face, neck, and arm, for half an hour every morning and evening, daily: so little expectation had he of any good effect being produced thereby, in this deplorable case, (and from the above opinion), that he did not enquire, as she was at a distance.

In the beginning of March, 1810, he saw the mother, who told him that her daughter's sight was so much improved, by continuing the use of the points, as directed, that she could now see to clean a room, and was able to do almost any work, but needle work. On the 18th of March the Author saw the girl, and was much surprised to find the specks much thinner. He asked her if she was able to read, she replied that letters dazzled her eyes. He told her not to attempt to read or look at the fire or candle light, or at any bright object. He gave her a green silk shade to wear on her forehead, and a pair of green spectacles. On the 25th, her mother said her daughter's sight was daily improving from these additional comforts.

On the eighth of April the white specks were scarcely visible, and she is able to assist her mother in washing and other work, which she could not attempt till now.

Let us consider what assistance her present imperfect sight has enabled her to afford to an infirm aged parent, who has an helpless husband, and a son only five years old to support, by the scanty earnings she gains, by wahing and other hard labour.

> Take physic Pomp,
> Expose thyself to feel what wretches feel,
> That thou may'st share the superflux to them!

The above case seems totally consonant with the foregoing theories and experiments of Mr. Davy and Dr. Garnet, on the power of the galvanic influence, exciting the suspended living action of the overloaded and distended small vessels of the eyes, which had lost their action from indirect debility produced thereby; but which, when excited to action, by the above stimulus, are enabled, by degrees, to absorb and carry off the matter, which obstructs the sight.

The same reasoning will equally account for the removal of palsy, dropsy in the chest, mortification in the foot, succeeding a white swelling in the knee, recorded in the Familiar Analysis; and it is equally probable, that these positive Galvanic points, drawn from the stomach, in various directions, towards the limbs, in contact with the skin, would prove a most valuable topical assistant to the medicines internally given, in obstructions of the liver, and various other internal obstructions; of the catamenia, &c. in women, also.

All of these arise from a suspension of nervous and vascular energy, producing want of circulation, obstruction, &c. in the parts, which may be removed by the electrical influence, arising from the friction of this positive galvanic circle of points, when drawn in contact with the skin.

Can we have stronger proof of the power of this influence, with regard to living action, when it is disordered or suspended?

The above cures, together with many others recorded by physicians, surgeons, and many other most respectable literary characters, &c. for years past, by the application of simple metallic points of various kinds, may appear incredible, without the above plain intelligible and rational theory to account for their action and influence; with it, they are just as rational and intelligible as the effects produced by any medicine.

When it is likewise considered that the most "*interested opponents*" to this topical assistant to medicine have never allowed these points the *power* of doing harm, for obvious reasons, prejudice must at length give way to reason.

This electrical influence has removed inflammation from the eyes; and sprains, bruises, and other complaints from the limbs of that noble and useful animal, the horse.

The real merits of this useful application, obviously so highly interesting to society in general, and the poor in particular, (many of whom have shed tears of gratitude for having thereby been restored to their labour and their bread,) may be publicly proved, at a trifling expence.

Perkins's patent having been declared not good in law, by the first legal authority; Galvanic pointed conductors (as here described) may be bought for half-a-guinea a set, with the above mentioned Analysis, which contains full directions for their application: and which only requires a room to be opened for the reception of invalids properly recommended, at certain hours of the day, and a person to apply these instruments *properly*, to prove what is here advanced.

The parts over which these points are drawn should be kept clean, and free from ointment, or grease of any kind, which is a non-conductor.

The points also should be kept clean, and *properly sharp*, particularly the silver (or copper) negative point, and they should be kept always of an equal length: they should be applied likewise so that both points may touch the skin at the same time, and thus form a perfect circle.—They should always be drawn *from* the head, stomach, and vital parts, to the limbs, and even to the ends of the fingers, or toes, in some disorders, particularly gout, for fear of translation.

These minutiæ are of the greatest consequence to the success of this simple operation; neglect of which has frequently produced a failure of effect.

Five or six hundred times drawing these points, whatever the space, is generally sufficient for one operation.

It seems contradictory to reason and nature, to refuse giving a fair trial to a cheap, simple remedy, which has every advantage to recommend it; from the highest authorities in Galvanism and Medicine; confirmed by long practical experience; without one single instance adduced where it has proved hurtful. At the same time, the question is of the highest consequence to the health and comfort of all ranks of society.

FINIS.

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